Editorial

Antipodean gold

Gold continues to feature strongly as a material of choice for leading-edge technologies, a phenomenon reflected in many of the presentations at scientific conferences held around the world. For example, in July I attended ICONN 2006, the *2006 International Conference on Nanoscience and Nanotechnology*, held most conveniently for me in Brisbane, Australia. I was intrigued to note that Element 79 cropped up in some form in nearly a fifth of the papers or presentations, but then, I should not have been surprised. In nanotechnology the central idea is to produce useful functional devices, systems and materials that are engineered at the nanoscale. Given that the oxide films formed naturally on most metals are hundreds, if not thousands, of nanometers in thickness, it follows that their presence will destroy nanoscale features on metallic structures. So if nanoscale structures with metallic surfaces are desired, then they must either be prepared and kept in an inert environment, such as vacuum, or they must be made of a metallic element resistant to oxidation. And, of course, what better choice for this element would there be than gold? Not only is gold almost immune to oxide formation under most ambient conditions, it is also readily formed into nanoscale structures by lithography, physical vapour deposition, by molecularly-mediated self-assembly, and by wet chemical crystallization. Add to this the thiophilic surface chemistry of gold which allows it to serve as a platform on which to build elaborate organic assemblies, not to mention its unique optical properties which provide a surface plasmon resonance in the middle of the visible portion of the electromagnetic spectrum, and you can readily appreciate why it is so valued by nanotechnologists.

Details of the relevant papers presented at this conference are to be found as a Conference Report in this issue. For me, the take-home message from this miscellany of gold-related items is that gold is an essential ingredient in modern science and technology, with uses and value out of proportion to its scarcity in the crust of this planet. In particular, I expect that gold will play a key role in many technologies currently under development. While individual applications may only use small quantities of the element, their aggregated effect is likely to have a material influence on overall consumption by the industrial sector.

Michael Cortie
University of Technology Sydney (UTS)
Australia
michael.cortie@uts.edu.au
http://www.nano.uts.edu.au/staff/cortie.html

Editor's note: Professor Cortie is a member of the Technical Advisory Committee of *Gold Bulletin* and chairs the Materials and Nanotechnology Committee of GOLD 2006.